



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,157	03/11/2004	Wenjie Li	FIS920030393US1	7576
30449	7590	06/01/2005	EXAMINER	
SCHMEISER, OLSEN + WATTS 3 LEAR JET LANE SUITE 201 LATHAM, NY 12110			LEE, SIN J	
			ART UNIT	PAPER NUMBER
			1752	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,157

Applicant(s)

LI ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Upon further consideration in view of applicants' argument, previous obviousness-type double patenting rejection on claims 1-20 over copending App. No. 10/820,117 in view of Iwasa et al'801 is hereby withdrawn. As argued by applicants, since the second polymer of claim 1 of App.'117 is a polyhydric alcoholic compound (because the second polymer clearly has more than one hydroxyl group in the polymer molecule), one skilled in the art would not be motivated to add additional polyhydric alcohol compounds taught by Iwasa et al'801 (to improve resolution) into the composition of claim 1 of App.'117.

2. Due to newly cited prior art, the following rejections are made *non-final*.

Claim Rejections - 35 USC § 103

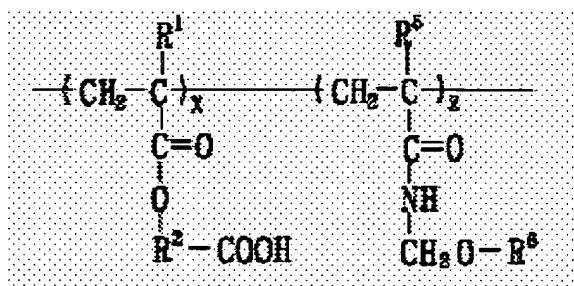
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasa et al (JP 2000-63433 and its Chemical Abstract (132:187644), and its machine-assisted English translation provided by Japan Patent Office) in view of Iwasa et al (6,074801).

Full, formal English translation of the Japanese document has been submitted. Only the Chemical Abstract and the machine-assisted English translation are available at this time.

Iwasa et al (JP'433) teaches (see Chemical Abstract) a chemically amplified negative-working resist composition containing a polymer having the general formula (I) and a photoacid generator, and the polymer of the formula (I) is shown below:



In the formula, R⁵ can be H or –CH₃, and R⁶ can be H or C₁₋₁₂ alkyl group. Since the polymer has contains a carboxylic acid group (an aqueous base soluble moiety), the polymer would be soluble in an aqueous alkaline developer solution (in fact, Iwasa uses *aqueous* tetramethylammonium hydroxide solution as his developer to dissolve unexposed portions of his composition – see [0072] of machine-translation). Therefore, the prior art teaches present invention of claim 1 except for the present multihydroxy-containing additive.

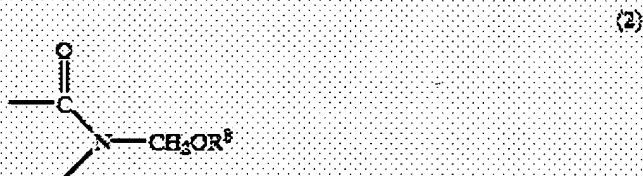
Iwasa et al'801 teaches the following (see col.3, lines 7-45):

Art Unit: 1752

In order to achieve an aspect of the present invention, a negative type photoresist composition includes a polymer which contains a repetition unit which is expressed by a general chemical formula (1), a crosslinker composed of a compound which contains a functional group which is expressed by a general chemical formula (2), and a photo-acid generator which generates acid in response to a light. The general chemical formula (1) is as follows,



where in the general chemical formula (1), R^1 is a hydrogen atom or a methyl group, R^2 is an alkylene group containing carbon atoms in a range of 7 to 18 and having a bridged cyclic hydrocarbon group, and a weight average molecule weight of the polymer is in a range of 1000 to 500000. Also, the general chemical formula (2) is as follows,

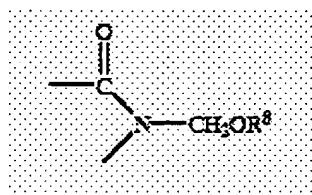


where in the general chemical formula (2), R^8 is a hydrogen atom, or an alkyl group containing carbon atoms in a range of 1 to 6 or an oxoalkyl group containing carbon atoms in a range of 3 to 6.

The negative type photoresist composition may further include a polyhydric alcohol compound.

Iwasa'801 teaches (col.18, lines 4-26) that when his negative photoresist composition contains polyhydric alcohol, resolution can be improved *because the polyhydric alcohol has high reactivity with the crosslinker (which has the functional group of*

Art Unit: 1752

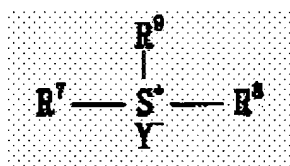


) so that the polyhydric alcohol acts as an accelerator of bridging.

As one of the examples for such polyhydric alcohol compound, Iwasa'801 discloses 1,4-cyclohexanediol.

Since Iwasa (JP'433)'s polymer shown above also contains the functional group of $-C(=O)-NH-CH_2-O-R^6$, and since Iwasa's composition is also negative-working, it would have been obvious to one of ordinary skill in the art to add a polyhydric alcohol compound such as 1,4-cyclohexanediol into Iwasa's composition in order to improve resolution as taught by Iwasa'801 (and, Iwasa (JP'433)'s polymer containing the functional group of $-C(=O)-NH-CH_2-O-R^6$ would chemically react with the 1,4-cyclohexanediol as taught by Iwasa'801). Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 1-6.

With respect to present claim 7, Iwasa (JP'433) teaches (see the machine-translation of [Claim 8]) that a sulfonium salt compound of the formula (7), which is shown below,



can be used as his photoacid generator. In the formula, R^7-R^9 can be an aromatic radical, and Y^- can be $Z-SO_3^-$ in which Z can be C_nF_{2n+1} ($n = 1-6$). Therefore, it would have been obvious to one of ordinary skill in the art to have R^7-R^9 to be phenyl groups and Y^- to be $C_4F_9SO_3^-$ with a reasonable expectation of obtaining a resist composition

having transparency at short wavelengths such as ArF excimer laser light and etching-resistance. Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present triphenylsulfonium perfluorobutanesulfonate of claim 7.

With respect to present claims 11 and 12, Iwasa (JP'433) teaches (see [0073] of machine-translation) the use of his polymer in the amount of 12.3 wt%, his photoacid generator in the amount of 0.65 wt.%, and his solvent in the amount of 87.0 wt.% in his photoresist composition. Therefore, Iwasa (JP'433) teaches present ranges of claims 11 and 12 for the polymer, solvent, and the acid generator. Iwasa'801 teaches (col.19, lines 4-9) that the polyhydric alcohol is used in the amount of 0.2-20 wt.% in order to accomplish improvement of resolution. Since this range overlaps with present ranges of claims 11 and 12 for the multihydroxy-containing additive, the prior art's teaching would have made present ranges *prima facie* obvious. In the case "where the [claimed] ranges overlap or lie inside ranges disclosed by the prior art," a *prima facie* case of obviousness would exist which may be overcome by a showing of unexpected results, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 11 and 12 (presence of the quencher is not required in present claims 11 and 12 because present claim 8 recites "at least *one* of a solvent and a quencher").

Iwasa (JP'433) teaches (see Chem. Abstract) that his resist composition is coated on a substrate, patternwise exposed to light of wavelength of 180-220 nm (in [0072] of machine-translation, Iwasa specifically teaches the use of an ArF excimer laser light (193.4 nm)), heat-treated, and then developed to form a resist pattern. Since

Iwasa (JP'433) also mentions that his resist material shows improved dry etch resistance, it is the Examiner's position that present etching step is impliedly taught by Iwasa (JP'433). Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 13-18.

With respect to present claim 19, Iwasa (JP'433) teaches (see [0072] of machine-translation) a silicon wafer as his substrate. Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present invention of claim 19.

With respect to present claims 8-10 and 20, Iwasa (JP'433) teaches (see [0071] of machine-translation) the use of a solvent in his composition, which examples include methyl ethyl ketone and ethylene glycol monomethyl ether. Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 8-10 and 20 (present claim language of claim 10 does not require the presence of the quencher because present claim 8 recites "*at least one* of a solvent and a quencher").

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 1752

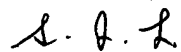
published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

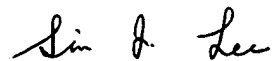
you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee

May 26, 2005



SIN LEE
PRIMARY EXAMINER